ARTICLE 9. **END OF TERM.** At the end of the Term, and provided that the AUTHORITY is not in default hereof, MFSNT or its assigns will ensure that all Facilities and Authority Telesystem are in good repair (normal wear and tear excepted) and title to all Facilities and Authority Telesystem shall be conveyed by MFSNT or its assigns free of any and all liens and encumbrances to the AUTHORITY, and accepted by the AUTHORITY, whereupon such Facilities and Authority Telesystem shall be owned by the AUTHORITY and MFSNT or its assigns shall have no further obligation to maintain, relocate or remove such Facilities or Authority Telesystem. The State shall obtain title and ownership of the NYS Fibers as further described in Article 3.

ARTICLE 10. **COMPENSATION.** For the first fifteen (15) years from the time as determined by the AUTHORITY through written notice to MFSNT that each individual Segment of the Facilities and Authority Telesystem is operational, MFSNT shall pay and remit to the AUTHORITY twenty-percent (20%) of the gross amount of any and all User Fees paid to MFSNT from Users for that individual Segment. MFSNT shall pay and remit to the AUTHORITY twenty-percent (20%) of any interest, late fees, or penalties collected from Users. From the beginning of Year Sixteen (16) of that time to the end of Year Twenty (20), MFSNT shall pay and remit to the AUTHORITY fifty-percent (50%) of the gross amount of any and all User Fees paid to MFSNT from Users for that individual Segment. Unless otherwise agreed by the parties, the AUTHORITY'S proportionate share of collected User Fees shall be paid to the AUTHORITY within five (5) days after receipt of such User Fee payment by MFSNT.

The State will pay MFSNT directly for installation of the NYS Fibers according to the provisions of Appendix F, "Consent to Assignment of Monies, State of New York Office of General Services". MFSNT agrees to provide the NYS Fibers to the State at a cost of twelve and fourteen one-hundredths cents ($.1214) per linear foot per fiber optic comunication strand.

The total cost of each Segment of the NYS Fibers will be divided into monthly payments over a period of twenty (20) years payable to MFSNT by the State commencing upon the State's written acceptance of the NYS Fibers in each Segment. The specific monthly payments, including interest, payable in arrears, by Segment are as follows:

Segment 1	15.01 Miles	$ 692.52
Segment 2	10.83 Miles	$ 499.66
Segment 3	36.54 Miles	$1,685.86
Segment 4	34.92 Miles	$1,611.12
Segment 5	141.92 Miles	$6,547.82
Segment 6	24.28 Miles	$1,120.21
Segment 7	40.25 Miles	$1,857.03
Segment 8	50.68 Miles	$2,338.24
Segment 9	50.08 Miles	$2,310.56
Segment 10	79.51 Miles	$3,668.38
Segment 11	82.43 Miles	$3,803.10
Segment 12	21.20 Miles	$ 978.11
Segment 13	51.13 Miles	$2,359.00

MFSNT agrees to maintain and repair the NYS Fibers at a cost to the State of five cents ($.05) per cable foot [includes all eight (8) NYS Fibers] per year, payable by the State directly to MFSNT on a quarterly basis in arrears. The specific quarterly payments by Segment are as follows:

Segment 1	15.01 Miles	$ 990.66
Segment 2	10.83 Miles	$ 714.78
Segment 3	36.54 Miles	$2,411.64
Segment 4	34.92 Miles	$2,304.73
Segment 5	141.92 Miles	$9,366.73
Segment 6	24.28 Miles	$1,602.48
Segment 7	40.25 Miles	$2,656.50
Segment 8	50.68 Miles	$3,344.88
Segment 9	50.08 Miles	$3,305.28
Segment 10	79.51 Miles	$5,247.66
Segment 11	82.43 Miles	$5,440.38
Segment 12	21.2 Miles	$1,399.20
Segment 13	51.13 Miles	$3,374.58

If such installation, Maintenance and repair payments are not received from the State, the AUTHORITY shall have no obligation to pay MFSNT, and failure to do so shall not be deemed a default by the AUTHORITY under this AGREEMENT or subject it to any damages, except that MFSNT may pursue its remedies with regard to the NYS Fibers.

In no event will any amounts received by MFSNT from the State be considered to be User Fees or Gross Revenue, except that MFSNT may use anticipated installation payments from the State for the NYS Fibers in calculating the Target Revenue Threshold. These amounts will under no circumstances be payable or due as compensation to the AUTHORITY.

ARTICLE 11. MARKETING AND COLLECTION OF USER FEES. MFSNT shall use its best efforts to market the Facilities to Users. MFSNT's best efforts shall include, but are not limited to, identifying and investigating, contacting, and negotiating with potential Users, and taking such other reasonable marketing steps designed to maximize the amount of User Fees to be collected. MFSNT shall obtain approval of the Authority Project Manager prior to the initial distribution of any printed materials or publication of advertisements.

MFSNT shall supply monthly reports on its marketing efforts to the Authority Project Manager, including a description of all entities contacted, the results of such contacts and advertising efforts. All User Agreements shall identify MFSNT as the party responsible for the invoicing, collection and monitoring of payments of User Fees from Users. MFSNT shall perform all invoicing and collection of User Fees, including actions necessary to secure collection of past due User Fees, in a commercially reasonable fashion. MFSNT shall secure the AUTHORITY'S consent to any write-off of accounts receivable from Users or any material agreements with Users for a reduced payment of past due User Fees, which consent shall not be unreasonably withheld.

ARTICLE 12. EXCLUSIVITY. Notwithstanding Article 2, the AUTHORITY hereby agrees that as long as MFSNT is not in default in its obligations under this AGREEMENT, the AUTHORITY shall not grant a license in, to, under or within the Rights of Way to any other party for the purposes of designing, installing, or operating a communications system similar to, or in competition with, the Facilities. The NYS Fibers shall not be deemed to be in competition with the Facilities. Unless the Facilities are filled to capacity and the AUTHORITY, during the first five (5) years of the term of this AGREEMENT, elects to add further communications capacity within the Rights of Way, then subject to any legal restrictions then applicable to the AUTHORITY, the AUTHORITY will provide MFSNT with a right of first refusal respecting such additional capacity. After the initial five (5) years, if the Facilities are filled to capacity, such additional capacity shall be secured by the AUTHORITY through a competitive process.
In the event that construction has not commenced on every Segment of the Facilities, the NYS Fibers and Authority Telesystem within the first five (5) years of this AGREEMENT, the AUTHORITY may, at its discretion, solicit proposals to construct any Segment upon which construction has not commenced through a competitive process. Agreements or extensions in duration of term of agreements between the AUTHORITY and other entities related to communications systems predating this AGREEMENT shall continue and are not covered by the terms of this AGREEMENT.

ARTICLE 13. **INDEMNIFICATION**. MFSNT shall indemnify and hold harmless the AUTHORITY and its elected and appointed officers (including Authority Project Manager, its boards, commissions, employees, and agents, legal counsel and contractors) from any and all injury, claim, demand, judgment, liability, or damage (collectively, "Claims') to the extent that such Claims arise out of or result from MFSNT's negligence in the Construction, Maintenance/Operation, or Removal of the Facilities, NYS Fibers, or Authority Telesystem. In no event shall MFSNT be liable for any punitive, consequential, incidental, or special damages or lost profits incurred or alleged to have been incurred by anyone.

The AUTHORITY shall indemnify and hold harmless MFSNT and its officers, directors, shareholders, employees, agents, legal counsel and contractors from any and all Claims beyond the extent to which MFSNT's liability or loss is satisfied or reduced by applicable insurance coverage, to the extent that such Claims arise out of or result from any negligence by the AUTHORITY or its officers, boards, commissions, employees, agents, legal counsel or contractors. MFSNT hereby agrees to use its best efforts to enforce all of its legal rights under any contract of insurance. In no event shall the AUTHORITY be liable for any punitive, consequential, incidental, or special damages or lost profits incurred or alleged to have been incurred by anyone.

Any party seeking indemnification hereunder ("Indemnitee") shall promptly notify the other party ("Indemnitor") of the nature and amount of such claim and the method and means proposed by the Indemnitee for defending or satisfying such claim. The Indemnitee shall consult with the Indemnitor respecting the defense and satisfaction of such claim, including the selection of and direction to legal counsel, and the Indemnitee shall not pay or settle any such claim without the prior written consent of the Indemnitor, which consent shall not be unreasonably withheld.

ARTICLE 14. **INSURANCE**. MFSNT shall maintain and keep in effect during the Term the following insurance coverages:

Item 1 **Insurance for Construction and Operation.** At its sole expense, MFSNT shall maintain insurance of such types and in such names as will provide adequate protection for MFSNT and the AUTHORITY and their respective officers, agents and employees against all liability, casualty, loss and risk to which MFSNT, the AUTHORITY, the Facilities, the NYS Fibers, and the Authority Telesystem may be exposed by virtue of this AGREEMENT, or by law.

Since this AGREEMENT includes both Construction and Maintenance/ Operations, MFSNT shall maintain insurance for each in accordance with the specifications listed below.

(A) Construction Insurance. During Construction, MFSNT shall maintain for the Facilities, NYS Fibers and the Authority Telesystem covered by this AGREEMENT:

(1) Comprehensive general liability insurance in which the AUTHORITY shall be named as an additional insured, including blanket contractual liability, owners and contractors protective liability, and completed operations coverage, with a combined limit of not less than $5,000,000.

(2) Builders risk insurance in the total amount of capital invested by MFSNT, in all of the Facilities and Authority Telesystem covered by this AGREEMENT.

(3) Workers' Compensation Insurance as required by New York State Law or Workers' Compensation Coverage either by purchase or by legally qualifying as a self-insurer in the State of New York.

(4) During Construction, MFSNT shall require any engineering or other professional firm involved in this AGREEMENT to maintain professional liability insurance in the amount of $2,000,000 with tail coverage for two (2) years.

(5) Automobile liability insurance with a combined limit of not less than $1,000,000.

(B) Maintenance/Operations Insurance. Relative to Maintenance/ Operations, MFSNT shall maintain for the Facilities, NYS Fibers and the Authority Telesystem covered by this AGREEMENT:

(1) Comprehensive general liability insurance in which the AUTHORITY is named as an additional insured, including products liability coverage and blanket contractual liability, with a combined limit of not less than $5,000,000 per occurrence; and

(2) Owners' protective insurance in the name of the AUTHORITY with a limit of not less than $2,000,000 per occurrence; and

(3) Owners' Landlords' and Tenants Liability in the name of the AUTHORITY, the Chairman and other Board members of the AUTHORITY with a limit of not less than $2,000,000 per occurrence; and

(4) Workers' Compensation Insurance as required by New York State Law or Workers' Compensation Coverage either by purchase or by legally qualifying as a self-insurer in the State of New York.

(5) Automobile liability insurance with a combined limit of not less than $1,000,000.

Item 2 General Insurance Requirements and Conditions. MFSNT must furnish to the AUTHORITY evidence of the insurance coverage required hereunder on the AUTHORITY'S certificate of insurance within thirty (30) days of the date of this AGREEMENT. Each certificate must provide for thirty (30) day prior written notice to the AUTHORITY in the event of cancellation or of a material change in any of the provisions. All insurance companies used by MFSNT must be authorized to do business in the State of New York. In the event the AUTHORITY requests to inspect the policies of MFSNT, MFSNT shall provide said policies or copies thereof at the then location of the policies.
The AUTHORITY agrees that MFSNT may satisfy insurance coverage limits over $1,000,000 for both Construction and Maintenance/Operations by means of an excess liability policy.

ARTICLE 15. SECURITY. MFSNT shall furnish to the AUTHORITY security for the faithful performance of all of the provisions of this AGREEMENT as described in Exhibit I, attached hereto and incorporated herein by this reference.

ARTICLE 16. TAXES, MECHANIC'S LIENS AND ENCUMBRANCES. During the Term, MFSNT shall pay, when due, all property (real or personal), possessory, income, excise and use taxes, special assessments and governmental fees of any kind whatsoever which may be levied or assessed upon the Facilities and Authority Telesystem. In addition, MFSNT shall be responsible for the payment of taxes levied upon its share of the User Fees received by it hereunder.

ARTICLE 17. ASSIGNMENT. MFSNT may not assign or otherwise transfer this AGREEMENT or the license herein granted without the prior written consent of the AUTHORITY. Pursuant to Appendix A, Paragraph 1, the AUTHORITY hereby grants its consent to MFSNT to enter into agreements, subject to Article 3 of this AGREEMENT, with third parties for financing of the design, Construction, Maintenance/Operation or Removal of the Facilities, the NYS Fibers or Authority Telesystem wherein third parties obtain an ownership interest in the Facilities, the NYS Fibers or Authority Telesystem. Pursuant to Appendix A, Paragraph 1, the AUTHORITY hereby grants its consent to the assignment of this AGREEMENT by MFSNT to any Affiliate of MFSNT.

ARTICLE 18. FORCE MAJEURE. The time of performance of any duty or obligation of the AUTHORITY or MFSNT hereunder shall be extended for the period during which performance was delayed or impeded by reason of riots, insurrections, war, fire, casualty, earthquake, acts of God or other reasons of a like nature not the fault of the party performing such duty or obligation.

ARTICLE 19. **APPENDICES.** Standard clauses (including Appendix A) and certain AUTHORITY required forms to be completed by MFSNT, and the "Consent to Assignment of Monies, State of New York Office of General Services" are attached hereto as Appendices A,B,C,D,E and F, and are incorporated herein by this reference.

ARTICLE 20. **MISCELLANEOUS PROVISIONS.** For purposes of interpretation of this AGREEMENT, it is understood between the AUTHORITY and MFSNT that the AUTHORITY is not the agent of the State, and that there is no agency relationship between the State and the AUTHORITY. The failure by the AUTHORITY or MFSNT to seek redress for violation of, or to insist upon the strict performance of, any condition or covenant of this AGREEMENT, or to exercise any right or remedy consequent upon a violation of this AGREEMENT, shall not constitute a waiver of any such breach or subsequent breach, or of such covenants, terms, conditions, rights and remedies. No provision of this AGREEMENT shall be deemed to have been waived by the AUTHORITY or MFSNT unless such provision is waived in writing. If any provision of this AGREEMENT is determined by a proper court to be invalid, illegal, or unenforceable, such invalidity, illegality or unenforceability shall not affect the other provisions of this AGREEMENT and this AGREEMENT shall remain in full force and effect without such invalid, illegal or unenforceable provision.

ARTICLE 21. **NOTICES**. All notices or other communications which are required or permitted herein shall be in writing and sufficient if delivered personally, sent by facsimile transmission followed by written confirmation of receipt, sent by overnight commercial air courier, or sent by registered or certified mail, postage prepaid, return receipt requested, to the parties at their addresses or facsimile numbers set forth below or to such other address or facsimile number as the party to whom notice is to be given may have furnished to the other party in writing in accordance herewith. Any such communication shall be deemed to have been given when delivered if delivered personally, the same day as facsimile transmission (or the first business day thereafter if faxed on a Saturday, Sunday or legal holiday), on the first business day after dispatch if sent by overnight commercial air courier, or on the fifth business day after posting if sent by mail.

IF TO MFSNT:
MFS Network Technologies, Inc.
1200 Landmark Center, Suite 1300
Omaha, Nebraska 68102
Attn: President and Legal Counsel
Facsimile: (402) 233-7582

cc:
MFS Communications Company
200 Kiewit Plaza
355 Farnam Street
Omaha, Nebraska 68131
Attn: General Counsel
Facsimile: (402) 977-5335

IF TO AUTHORITY:
New York State Thruway Authority
200 Southern Boulevard
P. O. Box 189, Albany, NY 12201
Attn: Executive Director
Facsimile: (518) 471-5058

DATED for reference purposes this 9th day of October, 1995.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed on the above date by the parties hereto.

NEW YORK STATE THRUWAY AUTHORITY

BY: _____
Stephen D. Morgan, Executive Director

MFS NETWORK TECHNOLOGIES

47-0714-393
Federal Identification No.

BY: _____
Kevin P. Moersch, President

Approved:

_____
Director of Thruway Finance

9/29/95
Date

Approved:

DEC 0 6 1995

_____
State Comptroller

_____
Date

Approved:

_____
Authority General Counsel

9-28-95
Date

Approved as to form:

APPROVED AS TO FORM
NEW YORK STATE
ATTORNEY GENERAL
OCT 13 1995
STEPHEN J. HENGEL
ASSOCIATE ATTORNEY

_____
State Attorney General

_____
Date

Contract Number X100168

AUTHORITY CERTIFICATION

In addition to the acceptance of this agreement, I also certify that all original signature pages will be attached to all other counterparts of this agreement.

NEW YORK STATE THRUWAY AUTHORITY

BY: _____
Stephen D. Morgan, Executive Director

AUTHORITY BOARD OF DIRECTORS AUTHORIZATION

The AUTHORITY Board at its Meeting Number 535 held on June 29, 1995 adopted Resolution Number 4548. This Resolution approved the financial terms and conditions of a tentative agreement with MFSNT and authorized the Executive Director to execute a final agreement based on the same financial terms and conditions. Based upon review of the general financial terms and conditions of the final AGREEMENT, and with advice of the AUTHORITY'S General Counsel and Director of Thruway Finance, I hereby authorize the Executive Director to execute this AGREEMENT.

BY: _____
Peter Tufo, Chairman

10/5/95
Date

* * * * * * * * * * *

STATE OF NEW YORK)
) SS.:
COUNTY OF ALBANY

On this 5 day of October, 1995, before me personally came Peter Tufo, to me known and known to me to be the CHAIRMAN of the BOARD constituting the NEW YORK STATE THRUWAY AUTHORITY, who being by me duly sworn, did depose and say that he resides at New York City NY; that he is the CHAIRMAN of the BOARD constituting the NEW YORK STATE THRUWAY AUTHORITY, the Corporation described in and which executed the foregoing instrument; that he knows the corporate seal of the said Corporation; that it was so affixed by authority of the Board constituting the NEW YORK STATE THRUWAY AUTHORITY, and that he signed his name by like authority.

_____
Notary Public

MICHAEL R. SIMPKINS
Notary Public, State of New York
Qualified in Saratoga County
Commission Expires March 30, 1996

STATE OF Illinois)
) SS.:
COUNTY OF DuPage)

On this 27th day of September 1995, before me personally came Kevin P. Moersch, to me known, and known to me to be the person who executed the above instrument, who, being duly sworn by me, did for himself depose and say that he resides at City of Omaha, County of Douglas, and State of Nebraska, and that he is President & CEO of MFS Network Technologies, Inc, and that he executed the foregoing instrument in the name of MFS Network Technologies, Inc, and that he had authority to sign same, and he did duly acknowledge to me that he executed the same as the act and deed of said MFS Network Technologies, Inc for the uses and purposes mentioned therein.

Mary Ann Ormiston
Notary Public

"OFFICIAL SEAL"
MARY ANN ORMISTON
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 11/3/98

* * * * * * * * * * *

STATE OF NEW YORK)
) SS.:
COUNTY OF ALBANY

On this 9 day of October, 1995, before me personally came Stephen Maciag to me known and known to me to be the EXECUTIVE DIRECTOR of the NEW YORK STATE THRUWAY AUTHORITY, who being by me duly sworn, did depose and say that he resides at Londonville NY; that he is the EXECUTIVE DIRECTOR of the NEW YORK STATE THRUWAY AUTHORITY, the Corporation described in and which executed the foregoing instrument; that he knows the corporate seal of the said Corporation; that it was so affixed by authority of the Board constituting the NEW YORK STATE THRUWAY AUTHORITY, and that he signed his name by like authority.

Notary Public

MICHAEL R. SIMPKINS
Notary Public, State of New York
Qualified in Saratoga County
Commission Expires March 30, 19[illegible]

EXHIBITS

EXHIBIT A	Authority Telesystem
EXHIBIT B	Rights of Way
EXHIBIT C	Segments
EXHIBIT D	Target Revenue Threshold
EXHIBIT E	Scope of Work
EXHIBIT F	MFSNT Technical Proposal for the Design, Installation, Operation and Maintenance of a Fiber Optic Infrastructure Along the Thruway/Canals Rights of Way
EXHIBIT G	New York State Accommodation Plan, Part 133
EXHIBIT H	Design Requirements
EXHIBIT I	Security

APPENDICES

APPENDIX A	Standard Clauses for all New York State Thruway Authority Contracts
APPENDIX B	Omnibus Procurement Act of 1992 Bid Proposal/Contract Requirements Insertion Clauses
APPENDIX C	Affirmative Action Program
APPENDIX D	Omnibus Procurement Checklist to Determine "Reasonable" Effort by Bidders/Contractors for Contracts
APPENDIX E	MacBride Fair Employment Principles Certification
APPENDIX F	Consent to Assignment of Monies, State of New York Office of General Services

EXHIBIT A

AUTHORITY TELESYSTEM

Table of Contents

1.0 System Description

MFSNT is providing a 155 Mbps OC-3 SONET (Synchronous Optical NETwork) network communication system backbone. Our design places twenty-three OC-3's strategically, at twenty-two sites throughout the right-of-way. Forty-seven 6 Mbps OVTG's (Optical Virtual Tributary Group) optically extend the network backbone to the remaining Toll Plazas and Toll Barriers.

MFSNT is placing all the electronic equipment (as shown in the attached worksheet), for the NYSTA communications network, within existing NYSTA buildings. The Albany Headquarters will be the largest of the sites MFSNT is installing. This site will house the Network Control Center (NCC) as well as electronics -- a room of approximately 500 square feet will be needed. The following identifies the room sizes for the remaining sites throughout the entire network:

- Division Offices (4) -- 200 square feet (10' x 20')
- FLM-150 Sites (22) -- 100 square feet (10' x 10')
- FLM-6 Sites (47) -- 100 square feet (10' x 10')
- Fiber Patch Panel Sites (65) -- 60 square feet (10' x 6')

Each of the communication rooms will need ceilings at a minimum height of 7'6" to accommodate the 7' relay racks and lockable doors. We will also need 110 VAC commercial power available in each room.

MFSNT used the RFP and specification requirements to:

- Examine Current Communication Needs,
- Calculate Optical System Attenuation, (See Appendix A),
- Configure Traffic Routing,
- Determine Maintenance and Operation Techniques,
- Identify Network Security,
- Analyze System Upgrades, and
- Develop a detailed Design and Cost.

Consistent with the Authority's desire for a state of the art fiber optic system expandable for its future needs, MFSNT selected an all optical transmission system based on SONET international standards. Our design provides superior system performance and generous optical budget to support expansion well beyond the needs currently foreseen. MFSNT provides NYSTA with 16 single mode fibers reserved exclusively for the Thruways needs.

MFSNT's OC-3 solution provides bandwidth for current needs, and capacity to meet future requirements. Future requirements include implementing an IVHS system. Our

SONET solution provides the required operating bandwidth for this. It also provides a private data communications network for alarm monitoring, provisioning, maintenance, and network operation.

MFSNT used a detailed process to select major equipment vendors. We developed detailed vendor specifications, documenting everything needed to meet your design requirements. Then we evaluated equipment vendors on their ability to meet these technical specifications, as reflected in their written responses to our inquiries. The following identifies the major electronics being installed and their equipment vendor.

- MFSNT selected the **Fujitsu FLM-150** (OC-3) and the **FLM-6** (6 Mbps OVTG) SONET Equipment – Other vendors considered include: AT&T, and Northern Telecom.
- We selected the **Tellabs Titan 5300 1/0 TCS** (Two-way cross-connect system) – Other vendors considered include: Walker & Associates, and Digital Switch Corporation.
- MFSNT selected the **Coastcom D/I Mux III T1 Intelligent Channel Bank** – Other vendors considered include: Telco Systems, and New Bridge.
- MFSNT selected the **Power Conversion Products PS19 *Twin Pack*® Power System** – Other vendors considered include: Argus, Ratelco, and LaMarche.

1.1 SONET System

MFSNT's solution consists of two OC-3 systems in linear configuration. The flexible **Fujitsu FLM-150** System can support Point-to-Point, Linear, or Ring fiber optic topologies. MFSNT is installing <u>two</u> linear OC-3 systems, an East System and a West System. The two systems converge at the Albany Headquarters. The East System consists of nine OC-3 sites located between the Albany Division Headquarters and the New Rochelle Toll Barrier. The West System consists of 14 OC-3 sites located between the Albany Headquarters and the Ripley Toll Barrier. Our FLM-150 placements are shown in **Exhibit 1.1-1, FLM-150 Installation Locations**. MFSNT will install the twenty-two FLM-150's in 7' x 23" relay racks.

East OC-3 System	West OC-3 System
Albany Headquarters	Albany Headquarters
Taconic Toll Plaza	Amsterdam Toll Plaza
Coxsackie Toll Plaza	Little Falls Toll Plaza

Saugerties Toll Plaza	Westmoreland Toll Plaza
New Paltz Toll Plaza	Syracuse Division Office
Mid-Hudson Division Office	Weedsport Toll Plaza
Woodbury Toll Barrier	Manchester Toll Plaza
New York Division Office	Henrietta Toll Plaza
New Rochelle Toll Barrier	Batavia Toll Plaza
	Buffalo Division Office
	Tonawanda Toll Barrier
	Blasdell Toll Plaza
	Silver Creek Toll Plaza
	Westfield Toll Plaza

Exhibit 1.1-1, FLM-150 Installation Locations

At the remaining forty-four Toll Plazas and Barriers, MFSNT will install Fujitsu FLM-6 OVTG (Optical Virtual Tributary Group) equipment to provide the optical interface to an OC-3 terminal. The FLM-6 systems will be mounted in 7' x 19" relay racks in all locations except Albany. At Albany, the four FLM-6's will be installed below the two FLM-150's in one mounting rack. The 19" mounting racks hold three FLM-6's, whereas the 23" mounting rack holds four.

MFSNT will populate the FLM-150 at New Paltz and New Rochelle with only a low speed card. The low speed card can drop or insert up to four DS1's. The channel bank will cross-connect to one DS1's on the low speed card, leaving three DS1's unused. These DS1's are available for future provisioning. The fifty-nine remaining Toll Plazas and Barriers will have one low speed card and a minimum of one OVTG card. At each of these locations, MFSNT will provision one DS1 on the low speed card to interface to the local channel bank.

The OVTG card includes the low speed card functionality. The OVTG card provides the electrical to optical conversion for up to four DS1's. The OVTG also adds the SONET overhead to the optical signal. MFSNT will provision one DS1 on the OVTG card, leaving three DS1's for future use. Each OVTG in the FLM-150 provides connectivity to one FLM-6. Twelve of the FLM-150's have either one or two OVTG cards. The Syracuse Division Office needs six OVTG cards

The equipment configuration in the Albany Division Headquarters significantly differs from the configuration in the other sites. This site is the common point for the East and West linear systems. The East System OC-3 has two low speed cards. The two cards provide the termination of five DS1's. The West System OC-3 also has two low speed cards. These two cards terminate eight DS1's. All thirteen DS1's from the two FLM-

150's cross-connect to the **Titan 5300 1/0 TCS**. The MFSNT design does not require OVTG cards in these two OC-3's.

MFSNT will install four FLM-6's in Albany. We will provide one DS1 on each FLM-6, leaving three unused. The four DS1's from the FLM-6's also cross-connect to the 1/0 TCS. The 1/0 TCS provides us a means to efficiently make electrical cross-connects and groom the DS0's for traffic routing.

Each of the remaining Toll Plazas and Barriers connect directly to an FLM-150. These connections between the FLM-150 OVTG and the FLM-6 are optical. The MFSNT provisioned DS1 provides the cross-connect to the local channel bank. Each site has an optical connection to its adjoining site. This provides the necessary connectivity between sites.

As developed by the SONET standards committee, the SONET overhead channel provides a shared data communications channel (DCC) to each FLM-150 and FLM-6. Under our approach, operations and maintenance personnel can use the DCC to its maximum extent. The DCC's primary purpose is alarm monitoring and provisioning.

Operations personnel also use the overhead to perform maintenance and software upgrades throughout the network, from a central location. The DCC provides these personnel a private network, built into the equipment, with which to communicate to each FLM-150, FLM-6, and other network elements. The fact that the DCC is incorporated into the equipment helps ensure network security. Operations and maintenance personnel can use the DCC to communicate with the network elements, making this communications path secure from outside intervention.

1.2 Electronic Digital Two-way Cross-Connect System

MFSNT will provide a **Tellabs Titan 5300 1/0 TCS**, cross-connect system. The 1/0 TCS will be in the Albany Headquarters and will occupy one 7' x 19" relay rack. The 1/0 TCS provides MFSNT a means to do electronic circuit grooming at the DS0 level. Active DS1's from the two FLM-150's and the four FLM-6's cross-connect to the 1/0 TCS. The 1/0 TCS grooms the traffic in a manageable fashion.

The 1/0 TCS helps limit equipment costs. Without it, traffic grooming requires multiple channel banks and a large Main Distribution Frames (MDF). The 1/0 TCS provides a quick and efficient way to provide circuit cross-connects, thus eliminating both wiring and maintenance labor. The 1/0 TCS can groom circuits for all types of Voice and Data circuits. It can groom: FXS, FXO, Voice Conferencing, E&M, 56/64 Kbps, 1.2 - 56 Kbps, Sub-Rate Multiplexed data, and Analog and Digital Bridged Data.

Within the 1/0 TCS, east DS1 is electronically demultiplexed into twenty-four DS0's. The incoming DS1's include the 56 Kbps data circuits, PBX tie lines, Radio tie lines, and channel bank control circuit DS0's. MFSNT employs the 1/0 TCS to provide DS0

circuit grooming for each type of DS0 circuit type. The DS0's are then multiplexed with like DS0's into DS1's and routed to their destination.

MFSNT provides efficient routing of the DS0-level circuits. We connect the 56 Kbps data circuits via three DS1's to the Thruway Authority's data terminal equipment in Albany. The PBX tie lines from the Division Offices connect to the Albany PBX using one DS1. Radio tie lines on another DS1 route as required. The channel bank control circuits connect to a local channel bank for their paths to the network management system.

Connectivity to the local channel banks is also through the 1/0 TCS. We have sized the 1/0 TCS for 25 DS1 port cards. It has a non-service affecting capacity for 64 DS1 ports. A larger 1/0 TCS, capable of upgrades to 1024 ports, is an option, should the Authority so desire at a later date. MFSNT sized our solution carefully, based on the information provided in the RFP.

1.3 Channel Bank

MFSNT will install a **Coastcom D/I Mux III T1 Intelligent Channel Bank** at each of the sixty-six sites. The channel banks use the same relay racks as the FLM-150's and the FLM-6's. We are providing two shelf types: an eight slot shelf and a twenty-four slot shelf. The Albany Headquarters and the Division Offices has 24 slot shelves, and the Toll Plazas and Barriers has eight slot shelves. Each channel bank operates in a Drop and Insert mode. This configuration allows us better control over the bandwidth required and the size of the 1/0 TCS.

The Authority's expectations for future IVHS affected our choice of vendors. MFSNT selected the Intelligent Coastcom channel bank over other channel banks. We selected the slightly-higher-priced and more versatile Coastcom channel bank due to its excellent flexibility and its design for IVHS control.

MFSNT provides each of the eight slot shelves with one 56 Kbps Data Card. The channel banks at each of the Division Offices have a pSDM (Premium Sub-rate Data Multiplexer) card and a 5-position RS-232 data port shelf. The pSDM provides a combination of up to 5 low speed channels ranging from 1.2 to 19.2 Kbps over one DS0. MFSNT uses the first channel to provide the 9.6 Kbps communications channel for channel bank control. The remaining four channels provide future control ports for IVHS.

MFSNT's design accommodates for the future IVHS technology implementation. This eases the transition to IVHS which will require extensive use of imbedded intelligence in network elements.

Using the pSDM allows the NYSTA to better manage its network bandwidth, an important cost containment consideration for the future. The pSDM allows NYSTA to

place multiple addressable components on the same sub-rate data channel. The pSDM supports synchronous and asynchronous, point-to-multipoint communications in a drop and insert mode.

For example, our design provides easy installation of IVHS signs. The Authority can install programmable variable-message signs throughout the right-of-way. Having done this, you can use one DS0 and Sub-rate Data Channel to communicate with each of the variable message signs along the system. One data channel then controls all the signs along the route versus one data channel per sign. The control computer would transmit the displayed message and address over the network. However, the signs would retain independence from each other. Each sign receives the message but only the sign with that address would respond and display the message. Multiple addresses can also be attached to the same message for display at multiple locations.

MFSNT's solution restrains the cost of adding IVHS and other functionality later. We reduce the number of data ports and hardware required. This leads to other savings. The reduced data ports mean less software required to operate and maintain the network. Our innovative arrangement reduces the amount of bandwidth needed. This reserves more capacity for other future communication uses.

MFSNT will install dual 4-wire E&M cards to provide the PBX tie lines. We will provide radio tie lines from each of the division offices to the Albany Headquarters. Each card provides two voice grade channels for intermachine trunking between PBX's.

Our installation will give the Authority many future options. A wide variety of other voice, data, and digital program cards is available. The channel banks can be provisioned using any of the different cards. Depending on the number of cards and the type of cards used, the DS1 can be mapped for almost any configuration, limited only by the 1.5 Mbps bandwidth and the number of card slots in a shelf.

1.4 Power System

MFSNT is placing the PCP PS19 *Twin Pack*® Power System. This is a modular rectifier system designed to house two rectifiers in a 5 ¼ shelf. MFSNT will equip each site with two 7.5 Amp rectifiers, both fitting into the single shelf. The Albany Division Headquarters will have four 7.5 Amp rectifiers, placed in two shelves. The PS19 accepts an input Voltage ranging from 95 to 132 VAC and 45 to 65 Hz while providing the necessary -48 VDC output. The two rectifiers plug into the front of the shelf. They are designed around the Switchmode MOSFET technology. The two 7.5 Amp rectifiers work together to provide a 15 Amp load.

Our application of these rectifiers encourages a long life. Using the two rectifiers provides the network with a load sharing system that increases the life of the rectifiers. In the event of a rectifier failure the second rectifier can handle the necessary load.

The rectifiers meet your technical specifications. The PS19 can operate at full power in an environment ranging from 0° to 50° C and 0 to 95% relative humidity. Its seismic rating meets the Bellcore requirements for Zone 4. Each system will be rack mounted and fully tested at the manufactures facilities. During installation, we will set the racks, install batteries, and connect power.

With the rectifiers, we are providing **Power Battery Company PRC-Series Sealed Batteries.** The PRC Series batteries uses the Valve Regulated Lead Acid (VRLA) design. This design immobilizes the acid in the battery in a sponge-like separator. Using the sealed batteries we have eliminated the need to add water. Besides being sealed these batteries are non-gassing and requires no equalizing charge. The batteries can operate at low temperatures without freezing and operate at a low internal pressure. These batteries are more safe for transport and handling than non-sealed batteries.

The batteries meet your standards, for size and cost. The batteries are designed to operate for ten years and provide a backup of 2.5 hours on a full 15 Amp load. Albany's batteries provides 3.0 hours on a full 30 Amp load. In the event of a power outage, this provides time for the NYSTA provided generators to get up to speed, or for a technician to service the rectifiers.

Each rectifier and battery power plant has a **PCP Mini Load Center MDM Panel.** The mini load center provides DC power distribution and protection to the load equipment. The MDM panel also provides the central termination bus bar, battery disconnect, metering for output current and voltage, and alarm monitoring. Each MDM panel has the number of breakers each site requires. Each power system will be racked, wired, and tested at the factory. Batteries will be tray mounted during the site installation.

1.5 Cross-Connect Panels

1.5.1 Fiber Distribution Panel

MFSNT selected the **Telect Fiber Distribution Panel** (FDP). MFSNT will install the FDP in the 19" racks in all locations. The two Telect FDP provides splicing and terminating for up to twelve or twenty-four fibers, respectively.

MFSNT provides superior quality fiber installation at field sites. MFSNT includes an FDP in every site identified in the RFP (131 sites). Each site will have its fiber cable entering from outside. We will route the cable to the splice trays in the FDP. MFSNT will splice pigtails on the end of the fibers and route the pigtails to the connector sleeve. We will terminate a minimum of 6 fibers per site. If a site needs more fibers terminated we will terminate in increments of six. Some of the sites will have 12 or even all 16 fibers terminated. We have selected the FC type of connector sleeve for the FDP. The FC connector provides an economical low loss connection and matches

the connector type on the FLM-150 and FLM-6. MFSNT will install blank connector plates covering the unused openings.

1.5.2 DSX-1 Cross-Connect Panel

MFSNT selected the **Telect Series 4000 DSX-1 Cross-Connect Panel.** This is a cost effective panel which will grow as the network grows. Each of the sixty-six sites with electronics being installed will have one panel, except that Albany will have more than one. The panel consists of two components – a chassis, and the patch panel modules. The chassis will house the patch panel modules. Each module consists of four DSX-1 positions. MFSNT provides the chassis in 23" racks at the FLM-150 sites and in 19" racks at the FLM-6 sites. We provide two modules at each of the toll barriers and toll plazas. The four division offices and Albany will have the chassis equipped as required. The Series 4000 DSX-1 panel uses a red indicator LED to trace cross-connects.

1.6 Network Management

MFSNT provides a Network Control Center (NCC) to be located at the Albany Headquarters. At the NCC, MFSNT will install a Network Management System (NMS) consisting of a Pentium based PC with thirty-two addressable RS-232 control ports using the UNIX operating system. Eleven of the thirty two control ports will be initially activated. This leaves the remaining control ports for the future implementation of the IVHS. The MFSNT NMS has capacity for 128 ports. The operating speed of the control ports supports up to 56 Kbps simultaneous throughput. We will operate the control ports at 9.6 Kbps.

This popular, easily obtained system provides the network control you need now and in the future, at an economic cost. The NMS will provide provisioning capabilities for the **Fujitsu FLM-150's,** and FLM-6's, the **Coastcom D/I Mux III T1 Channel Banks,** and the **Tellabs Titan 5300 1/0 TCS.** The NMS will be loaded with Fujitsu's FLEXR Plus Network Management software and Coastcom's Network Communications Controller (NCC) Plus software.

Fujitsu's FLEXR Plus Network Management Software is design to simplify the network operation and maintenance functions to each Network Element (NE). The FLEXR Plus software enables MFSNT to perform centralized provisioning, maintenance and alarm monitoring of the entire SONET network. The FLEXR Plus using a mouse provides easy pull-down menu's and graphic pictures representing the installed equipment to easily identify alarm locations.

Using these graphics the NCC Technician can easily view the FLM-150 or FLM-6 shelf as if the technician were on site, and identify all the alarms prior to a tech arriving. The graphics also make provisioning circuits between two points as simple as "point-and-

click". With the graphic interface the NCC Technician can view the shelf inventory as well as list the shelf inventory, and view all the shelf alarms.

The FLEXR Plus also provides history records of network surveillance, performance monitoring and alarm conditions. All the history files can be stored as backup and retrieved as required.

Operators at the NCC obtain access to the FLM-150's and the FLM-6's in the field through the DCC ports on the two FLM-150's in Albany. These two connections provide the data communications channel for both systems. The four FLM-6's in Albany have their own connections. The channel banks have their own connection to the NMS using the pSDM ports. Five control ports are reserved for the channel bank control. To control costs, we provide channel bank control only for the four channel banks located at the division offices and the two channel banks located in the Albany headquarters. These are the largest channel banks, and provisioning needs at the others does not warrant the expense. When IVHS is implemented, you can easily upgrade your channel bank control to access all the channel banks from the NCC. This will require approximately fifteen control ports for the channel banks. The 1/0 TCS in Albany will also have a control port.

The control ports provide efficient, centralized administration, and increased service quality on the Authority's network. Besides using the control ports for provisioning, the Authority can also use them for alarm monitoring and maintenance. The NMS provides NCC technicians the ability to identify alarm conditions. The technician at the NCC can then either correct the condition before it becomes service affecting, or dispatch a Field Technician to correct the situation. Our NMS simplifies network management for the technicians maintaining the network. In turn the network becomes more reliable and more friendly to the network users.

MFSNT provides a modern maintenance support system that minimizes costly field time for skilled workers. We provide five 486 based laptop PC's for the Field Technicians. One is located at each of the four division offices, and one in Albany. A Field Technician on a maintenance call can use the laptop to gain local access to the intelligent communications equipment (FLM-150, FLM-6, and Channel Bank) through a craft interface port. During trouble shooting, both the technician in the NCC and the Field Technician can log into the FLM-150 or FLM-6. One uses the craft interface and the other uses the DCC. The Field Technician upon identifying the error uses network management software to correct alarms, provision equipment, or perform maintenance. Each laptop will be loaded with Windows, FLEXR, FLEXR-FLM6, and a communications software package. The Network Communications Control (channel bank) software will not be loaded in the laptops. The laptops will emulate a VT-100 terminal to provide channel bank communications.

1.7 Alternate Network

To furnish redundancy, MFSNT will work with NYSTA to provide a NYSTA leased Dedicated/Switched network using both the Local Exchange Carriers' (LEC) and the Interexchange Carriers' (IXC) networks. NYSTA will be responsible for the installation and monthly recurring cost of the associated redundant network, leased from the LEC's and IXC. The LEC will provide a combination of dedicated and switched circuits. The IXC backbone will consist of switched circuits only.

MFSNT will assist NYSTA in equipping each NYSTA toll barrier and plaza with a dedicated WATS Access Line (WAL). These lines transmit at speeds up to 56 Kbps. These WAL (originate only) circuits switch through the local network to an IXC's Point-Of-Presence (POP) over Feature Group D (FGD) trunks. MFSNT will access the IXC through these trunks in each of the six Local Access Transport Areas (LATA):

- New York
- Poughkeepsie
- Albany
- Syracuse
- Rochester
- Buffalo

FGD trunks will provide the switched connectivity to the IXC's network. The IXC switches the 56 Kbps circuit in its network to the Albany POP.

FGD trunks replace the dedicated circuits between the LEC central office and the IXC POP. This equal access circuit will be conditioned for the transmission of the 56 Kbps data circuits. The FGD trunks provide a cost effective solution to switch the circuits. NYSTA will be charged only for the usage of the circuits. Conversely, in a dedicated network NYSTA is charged whether or not the circuits are used.

In Albany, the IXC switches the 56 Kbps circuits to the terminating WAL circuits. The Albany WAL circuits are set up in a hunt group. When a call from a toll plaza/barrier comes into the hunt group, the first available line will respond and take the call. The hunt group can be set up in four hunt configurations. These configurations include:

1. Low to High,
2. High to Low,
3. Least Busy, and
4. Most Busy.

MFSNT recommends either option 1 or 3 for the hunt configuration. This circuit provides the redundant connection to the toll plaza/barrier. FGD switched service reduces the number of circuits required in Albany, by removing the dedicated circuit